Brief article

The route to change: Within-session predictors of change plan completion in a motivational interview

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Abstract

This study is the first to examine within-session therapist and client language/process predictors of a client's decision to complete a written Change Plan in an alcohol-focused motivational interview (MI). Data were from an ongoing hospital-based clinical trial ($N = 291$). Trained raters coded audiorecorded MI sessions using the Motivational Interviewing Skill Code. Logistic regression analyses found that therapist MI-consistent behaviors ($b = .023$, $p < .001$) and client change talk ($b = .063$, $p < .001$) were positive predictors, and client counter change talk ($b = −.093$, $p < .001$) was a negative predictor of the decision to complete a Change Plan regarding alcohol use. Mean comparisons showed that compared to noncompletion, Change Plan completion did not result in significantly greater changes in client motivational readiness. Completion of a Change Plan is a proximal outcome in MI that is associated with client intention to change (change talk) and may predict follow-up alcohol outcomes. Analyses of such theory-driven proximal client mechanisms provide a more complete model of MI process and may inform MI providers of necessary treatment ingredients. © 2010 Elsevier Inc. All rights reserved.

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1. Introduction

An emerging body of research is examining the therapeutic processes of motivational interviewing (MI) that may lead to reductions in alcohol or other drug use. Miller and Rollnick (2002) describe MI as a counseling style that helps clients explore and resolve ambivalence related to behavior change. Subsequent theoretical work has placed the approach within a psycholinguistic framework where positive behavioral action emerges from the dialogue of the MI and, particularly, through therapist selective reinforcement of client prochange statements (Amrhein, 2004; Miller & Rollnick, 2004). This language of change, or "change talk," is hypothesized to mediate both proximal

and long-term outcomes (Miller & Rollnick, 2002). In the seminal empirical work on the topic, strength of client commitment statements at the end of the MI session, the time at which written Change Plans are completed, was predictive of drug use at 1-year follow-up (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003; Miller, Moyers, Ernst, & Amrhein, 2008). The subsequent literature has considered two primary research directions: therapist behaviors and client change talk (i.e., processes within sessions) and specific MI components (i.e., broad areas of discussion, e.g., Change Plan).

A recent meta-analysis of within-session mechanisms of change in MI found the most consistent support for therapist MI-inconsistent behaviors (e.g., confrontations) in relation to poor substance use outcomes and client intention, or commitment, statements and experience of discrepancy in relation to positive substance use outcomes (Apodaca & Longabaugh, 2009). In individual studies, client change talk has been related to changes in substance use with adult and

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adolescent illicit drug users (Amrhein et al., 2003; Baer et al., 2008) and with adult alcohol users (Guame, Gmel, & Daeppen, 2007; Moyers et al., 2007). Moreover, therapist MI-consistent behaviors (e.g., complex reflections, open questions) have been associated with client change talk (Gaume, Gmel, Faouzi, & Daeppen, 2008; Moyers & Martin, 2006).

Component-level analyses of MI have evaluated the written personalized feedback report (Juarez, Walters, Daugherty, & Radi, 2006; Monti et al., 2007) and decisional balance exercise (LaBrie, Pederson, Earleywine, & Olsen, 2006; LaBrie, Pederson, Thompson, & Earleywine, 2008; McNally, Palfai, & Kahler, 2005) and have found these components effective in reducing alcohol use and related consequences. Completion of a plan to change alcohol or other drug use is another MI component that may represent a culmination of the motivational dialogue resulting in verbal statements of intention and a written contract for behavior change. In fact, Strang and McCambridge (2004) found that of the MI intervention characteristics examined, discussion of change was the only predictor of clinically meaningful reductions in marijuana use among non-help-seeking young adults. Although treatment studies have typically delivered MI as a manualized intervention, it is often flexibly delivered with the Change Plan conducted only upon client agreement. Therefore, a client's decision to complete a Change Plan may be an important proximal outcome to MI, representing at least partial resolution of ambivalence, increasing cognitive intention, and therefore serve as a precursor to later behavior change.

MI may be particularly useful with high-risk populations in which only brief and "opportune" contact is possible. At-risk alcohol users seen in hospital emergency departments (EDs) or trauma centers are an example of this type of population. Although nearly half of trauma patients screen positive for problematic alcohol use, only 10% report ever having spoken to their physician about the use of alcohol (Schermer, Bloomfield, Lu, & Demarest, 2003). However, MI-based brief interventions in hospital settings have been shown to reduce alcohol-related consequences (Harvard, Shakeshaft, & Sanson-Fisher, 2008) and injuries (Longabaugh et al., 2001), traffic violations, and DUI arrests (Monti et al., 1999; Schermer, Moyers, Miller, & Bloomfield, 2006).

Those seen in opportune settings may or may not enter the MI session motivated to change their drinking or related behaviors. MI theory would propose that both negative and positive change talk are vital to the therapeutic process; the therapist is to help the client explore and resolve ambivalence (Miller & Rollnick, 2002). Empirically, this would be represented by a decrease in negative change statements over the course of the session combined with increases in positive change statements. Considered another way, only client-rated achievement of "new understanding" was associated with completion of a Change Plan among hospital ED patients (Lee et al., 2007). In subsequent work, those with high reported motivation at baseline were more likely to

complete targeted Change Plans, which were associated with reduced alcohol consequences at 12-month follow-up (Lee et al., under review; Stein et al., 2009). Finally, motivation to change mediated the relationship between MI and reduced consequences but, again, only for these high motivation clients (Stein et al., 2009). This study further examines these types of processes, that is, client motivation, within-session change language, and the decision to complete a written Change Plan.

To our knowledge, this work is the first to integrate observer-rated process- and component-level analysis to examine a client's decision to complete a written Change Plan in an alcohol-focused MI. Data were from an ongoing hospital-based clinical trial. The present aims were to replicate and extend previous work by first examining composite therapist MI-consistent behaviors, therapist MI-inconsistent behaviors, client change talk, and client counter change talk as predictors of the within-session proximal outcome of completion of a Change Plan. Subsequent analyses considered which individual therapist and client variables were most important to Change Plan completion. Finally, we examined completion of a Change Plan in relation to baseline and postsession readiness to change alcohol use.

2. Materials and methods

2.1. Sample

Participants ($N = 291$) were adult emergency and trauma department patients from a large hospital in the northeast United States. The parent study was a randomized controlled trial that compared the efficacy of an individual MI to an MI that included a significant other. The study sample included adult patients who (a) had a blood alcohol concentration greater than 0.01% or self-reported alcohol use in the 6 hours prior to hospital entry or scored 8 or higher on the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993); (b) scored 18 or higher on a mini-mental status exam; and (c) identified at least one significant other appropriate for inclusion in the study. Participants who did not speak English, had a self-inflicted injury, or were in police custody were excluded. To be eligible to participate as a significant other, individuals had to be rated as at least "supportive" in the participant's life and be no more than a "moderate" drinker (Important People Instrument; Longabaugh & Zywiak, 1998). All procedures were approved by the university and hospital institutional review boards, and participants gave written informed consent.

2.2. Intervention conditions

The two treatment conditions followed central MI principles and techniques described by Miller and Rollnick

(2002). These single-session manualized interventions explored participant alcohol use and motivation to make changes in their drinking and had eight possible components: Describe the Accident/Injury, Typical Week of Alcohol Use, Pros and Cons of Alcohol Use, Personalized Feedback on Alcohol Use, Exploring Goals and Values, Looking Forward/Looking Back, Importance and Confidence Rulers, and a written Change Plan. Toward the end of MI sessions, the Change Plan was introduced and described, and the participant was given the opportunity to complete it. Change Plan worksheets included identification of measurable goals regarding alcohol use, reasons and supports for change, specific actions toward change, and planning for setbacks. When a Change Plan was declined, MI sessions would end with a component aimed at further motivational enhancement (e.g., Exploring Goals and Values, Looking Forward/Looking Back). The significant other MI sessions included the same components but added strategies intended to enlist significant other involvement in enhancing motivation and supporting efforts toward change. The MI sessions were conducted by 12 doctoral- and master's-level counselors; training included 25–30 hours of didactic learning, discussion, and role-plays, and the therapists received MI supervision weekly. All MI sessions were audiorecorded.

2.3. Coding procedure and instrument

The MI sessions were transcribed prior to process coding. After transcription, five trained bachelors- and masters-level raters coded therapist and client language variables with the second version of the Motivational Interviewing Skill Code (MISC 2.0; Miller, Moyers, Ernst, & Amrhein, 2003). The MISC assesses 19 specific therapist behaviors that fall into three main categories: MI-consistent (affirm, emphasize control, open question, advise with permission, raise concern with permission, simple reflection, complex reflection, reframe), MI-inconsistent (advise without permission, raise concern without permission, confront, direct, warn), and neutral (facilitate, filler, closed question, giving information, support, structure). When measuring client change language, a target behavior is identified to facilitate specificity and reliability of ratings (Miller et al., 2003). For this study, change language was examined in relation to alcohol use reduction or cessation and avoidance of future alcohol-related injuries or other negative consequences. The MISC has seven client language codes (reason, desire, need, ability, commitment, taking steps, other) that are scored on occurrence (frequency), direction (positive or negative), and strength (5-point scale). Individual items produce a total count score. For primary analyses, composite sums of MI-consistent and MI-inconsistent therapist behaviors and for client-positive (change talk) and client-negative change language (counter change talk) were examined. Finally, raters were trained to code the occurrence of the eight MI

components (yes/no) in each within-session decile (one-tenth units of session length).

The study raters received roughly 40 hours of training in the MISC system, and ongoing weekly supervision was provided by the first and second authors. The training protocol involved graded learning tasks, beginning with simple to increasingly complex identification of therapist and client behaviors. Raters progressed through a training library of role-play and pilot audiotapes until rating proficiency was achieved (an interclass correlation coefficient [ICC] of .75 or greater). Weekly supervision meetings addressed coder questions, specified decision rules, and provided targeted training on low agreement items. A 20% random selection of cases was double-coded to verify continued rater reliability. Cicchetti (1994) suggests guidelines for ICC ratings as follows: below .40, poor; .40 to .59, fair; .60 to .74, good; and above .75, excellent. The ICC values (*n* = 67; five raters) across composite therapist and client language variables were in the "good" to "excellent" range (Cicchetti, 1994; ICC = .69–.99; see also Table 1).

Table 1
Descriptive findings and reliability for therapist behavior and client language variables [a]

Session rating	ICC [b]	M	SD	Min	Max
Therapist MI-consistent	.99	96.01	46.54	23	258
Simple reflection	.89	32.95	21.21	3	127
Open question	.94	28.12	13.22	6	77
Complex reflection	.78	27.85	19.65	0	104
Affirm	.79	4.47	3.96	0	24
Emphasize control	.72	1.49	1.30	0	11
Raise concern with permission	.92	0.44	1.28	0	10
Reframe	.32	0.35	0.76	0	4
Advise with permission	.73	0.35	1.02	0	6
Therapist MI-inconsistent	.69	1.09	1.98	0	12
Advise without permission	.77	0.36	1.01	0	10
Confront	.60	0.28	0.81	0	6
Warn	.66	0.18	0.61	0	5
Direct	.33	0.17	0.53	0	4
Raise concern without permission	.30	0.09	0.34	0	3
Client change talk	.94	41.42	27.33	0	159
Reason—positive	.87	18.48	12.48	0	70
Ability—positive	.85	6.02	6.98	0	62
Commitment—positive	.79	4.79	5.94	0	32
Desire—positive	.74	1.85	2.83	0	23
Taking steps—positive	.71	1.58	2.53	0	23
Need—positive	.60	1.38	2.15	0	11
Client counter change talk	.91	18.14	12.61	1	74
Reason—negative	.85	13.06	9.63	0	57
Ability—negative	.64	2.06	3.48	0	32
Desire—negative	.41	0.73	1.42	0	10
Commitment—negative	.68	0.60	1.45	0	17
Need—negative	.45	0.28	0.87	0	7
Taking steps—negative	.38	0.22	0.66	0	4

Two-way mixed, single measure ICC; *N* = 291.

[a] Occurring in Deciles 1 through 8.
[b] Double code, *n* = 67.

2.4. Measures

Client self-report measures were baseline alcohol severity and reported readiness to change alcohol use. Baseline alcohol severity was measured with the AUDIT (Saunders et al., 1993), which includes 10 items related to quantity and frequency of drinking, alcohol dependence symptoms, and related problems. Each question is scored from 0 to 4, with a score of 8 or more reflecting harmful alcohol use (Conigrave, Hall, & Saunders, 1995). The smoking Contemplation Ladder (Biener & Abrams, 1991) has been previously modified to assess motivation to change drinking behavior in a hospital-based MI study (Becker, Maio, & Longabaugh, 1996). The single-item measure states, "Each rung of this ladder represents where a person might be in thinking about changing their drinking. Select the number that best represents where you are now." Item options range from *no thought of changing* (0) to *taking action to change* (10). For analyses of client readiness, a baseline to postsession change score was computed.

2.5. Data analysis

Excessively skewed (greater than ±2) variables were log-transformed prior to analyses (i.e., MI-inconsistent behaviors). Initial analyses included assessment of early-session change language and baseline motivation by Change Plan (completed vs. noncompleted) groups via independent samples *t* tests. Hierarchical logistic regression analyses were used to test the relationship between composite therapist MI-consistent and MI-inconsistent behaviors, client change talk and counter change talk, and the dichotomous outcome of completion of a Change Plan. Analyses maintained the temporality of process predictors by examining therapist and client variables in session deciles (one tenth of session length) one through eight (86% of completed Change Plans occurred in Deciles 9 and 10). Analyses were conducted while controlling for client age, gender, baseline alcohol severity (AUDIT), baseline readiness to change alcohol use, recruitment status (injured or not injured), assigned therapist (dummy code), and treatment condition (MI or significant other MI) in the first step and the MI process variables in the second step. Significant composite predictors (i.e., therapist MI-consistent behavior, client change talk, and counter change talk) were then disaggregated in a series of stepped logistic regression models. Individual therapist and client variables with unacceptable skew or "poor" reliability were excluded from these disaggregated analyses (i.e., therapist advice and raise concern with permission, therapist reframe, and client negative need and taking steps statements). Finally, an independent samples *t* test examined whether completion of a Change Plan resulted in significantly greater baseline to postsession changes in client readiness to change alcohol use than noncompletion of a Change Plan.

3. Results

3.1. Descriptive characteristics of the sample

The study sample had a mean age of 33 years ($SD = 11.4$); most of the participants were male (69%), 71% were Caucasian, 18% were African American, and 11% were other race. The mean AUDIT score was 15.3 ($SD = 8.2$), and roughly 52% were recruited following an injury. Reported mean score on readiness to change alcohol use was 5.9 ($SD = 3.7$; the scale anchor for 5 was "I should change someday, but I am not ready"). Approximately half (53%) of the sample made the decision to complete a Change Plan.

3.2. Descriptive characteristics of MI sessions

Of 306 MI sessions, 15 could not be coded due to technical problems ($n = 4$ tape malfunction; $n = 11$ poor sound quality). Table 1 shows descriptive findings and reliability for individual therapist behavior and client language variables, occurring in session Deciles 1 through 8. Therapists made the greatest use of open questions and both simple and complex reflections. MI-inconsistent behaviors were quite infrequent. Among participants, reasons, both positive and negative, were the most common type of change statements.

3.3. Change plan completers: do they start out more ready?

Fig. 1 shows patterns of change talk and counter change talk by Change Plan completion status (completers, $n = 153$; noncompleters, $n = 138$) in Deciles 1 through 8. Fig. 1 shows a greater slope in change talk prior to the Change Plan decision point in completers compared to noncompleters, whereas the slope of counter change talk did not differ across groups. Moreover, those who completed a Change Plan made significantly more positive change statements ($M = 2.9$ [3.5] vs. $M = 1.7$ [2.8], respectively) in the first decile of the session than those who did not complete a Change Plan,
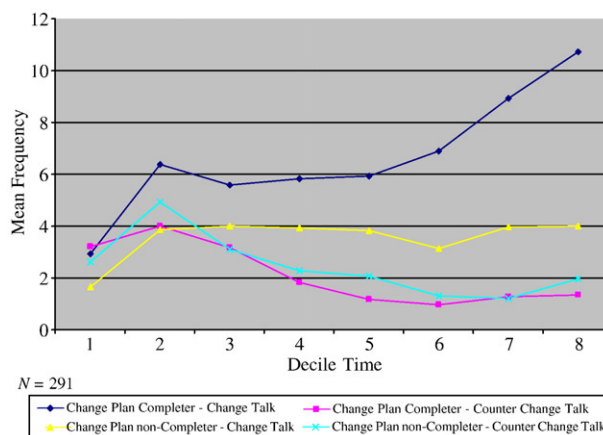

$N = 291$

Fig. 1. Client change talk and counter change talk by Change Plan completion.

$t(289) = -3.40$, $p < .005$, whereas the difference in Decile 1 counter change talk was nonsignificant, $t(289) = -1.14$, *ns*. However, a measure of baseline readiness taken prior to the session did not differ between Change Plan completers and noncompleters, $t(289) = 1.78$, *ns* ($M = 5.5$ [3.8] vs. $M = 6.3$ [3.5], respectively). Therefore, clients who ultimately chose to complete a Change Plan had similar reported baseline readiness to change compared to those who did not but began the session voicing more arguments for change. Change Plan completers additionally showed greater overall increases in those arguments over the course of the MI, $t(289) = -8.24$, $p < .001$. Changes in counter change talk over the course of the session were nonsignificant.

3.4. Predictors of Change Plan completion

Table 2 shows composite within-session predictors of Change Plan completion while also considering preexisting client and therapist variables. Of these covariates, only therapist was significant and showed that clients were less likely to complete a Change Plan when assigned to a specific therapist. This covariate was included in all follow-up analyses. Regarding process variables, therapist MI-consistent behaviors and client change talk were positive predictors of Change Plan completion, whereas client counter change talk was a negative predictor. Therapist MI-inconsistent behaviors were nonsignificant. The total model accounted for 54.2% of the variance in Change Plan completion, $\chi^2(df, 264) = 145.893$, $p < .001$.

Follow-up analyses disaggregated therapist and client composite variables that reached statistical significance in the preceding analyses. These analyses included two logistic regression models of individual therapist MI-consistent behaviors ($k = 6$) and individual client change talk and counter change talk items ($k = 10$). Significant Change Plan predictors from the therapist and client models were then placed into a final, stepped, logistic model. Table 3 shows results of these analyses. The final model, which included

Table 2
Composite model predicting Change Plan completion

Predictor	B (SE)	Wald	p
Covariates			
Age	−0.022 (0.015)	2.292	.130
Gender	−0.089 (0.370)	0.057	.811
AUDIT	0.009 (0.022)	0.161	.688
Readiness	−0.049 (0.049)	1.001	.317
Recruitment status	−0.670 (0.358)	3.515	.061
Assigned therapist [a]	−2.221 (0.773)	8.258	.004
Treatment condition	0.418 (0.333)	1.569	.210
Predictors			
Therapist MI-consistent	0.023 (0.006)	13.534	<.001
Therapist MI-inconsistent	0.170 (0.286)	0.355	.552
Client change talk	0.063 (0.010)	38.522	<.001
Client counter change talk	−0.093 (0.018)	26.559	<.001

Note. $n = 280$; Nagelkerke $R^2 = .542$, $p < .001$.

[a] Coefficient for significant therapist (dummy code) shown.

Table 3
Final logistic model predicting Change Plan completion

Predictor	B (SE)	Wald	p
Covariate			
Assigned therapist [a]	−2.264 (0.845)	7.185	.007
Therapist behavior			
Open question	0.040 (0.019)	4.484	.034
Affirm	−0.077 (0.319)	0.058	.810
Client language			
Ability—positive	0.976 (0.255)	14.689	<.001
Commitment—positive	0.337 (0.067)	25.353	<.001
Desire—positive	0.823 (0.311)	6.991	.008
Desire—negative	−0.739 (0.382)	3.753	.053
Reason—negative	−0.044 (0.021)	4.660	.031

$N = 291$; Nagelkerke $R^2 = .676$, $p < .001$.

[a] Coefficient for significant therapist (dummy code) shown.

therapist covariate and individual therapist and client predictors (accounting for 67.6% of the variance in Change Plan completion) $\chi^2(df, 278) = 205.454$, $p < .001$, highlights the importance of therapist use of open questions and client positive commitment, ability, and desire statements as positive predictors and client negative reason statements as a negative predictor of completion of a written Change Plan.

3.5. Change Plan completion in relation to changes in motivational readiness

Mean comparisons showed no differences in baseline to postsession change in reported readiness to change alcohol use between those who completed a Change Plan and those who did not, $t(268) = -0.32$, *ns*.

4. Discussion

The Change Plan is a decision point that occurs toward the end of the MI, reflecting a key transition from *building motivation* to *negotiating a plan* (Miller, Zweban, DiClemente, & Rychtarik, 1992). Client agreement to engage in that negotiation may therefore be a marker of successful transition from exploration to intent. Consistent with our expectations, therapist MI-consistent behavior and client change talk were positive predictors, and client counter change talk was a negative predictor of the decision to complete a Change Plan regarding alcohol use. Unexpectedly, MI-inconsistent behavior was not a significant negative predictor of Change Plan completion.

Our study of Change Plan completion in relation to client motivation revealed a complex picture. Change Plan completers began the session voicing more arguments for change than noncompleters but were not higher in self-reported motivational readiness. Those that chose to complete a Change Plan also demonstrated a greater slope in positive change statements, whereas those who did not showed little movement in language, positive or negative, over the course of the interview. These findings are similar to

that found by Stein et al. (2009) in relation to motivation. Contrary to our expectations, Change Plan completion did not result in a greater increase in self-reported readiness to change alcohol use than noncompletion. It is unclear why motivation findings did not mirror that found for positive change talk, but increase in motivation may be more distal after Change Plan behaviors are enacted.

4.1. Individual client and therapist predictors

Follow-up analyses showed that specific subdimensions of client language were more important than others. Among the client variables examined, positive commitment, ability, and desire statements were positive predictors, and negative reason statements were negative predictors of Change Plan completion. Findings on positive commitment statements are consistent with some previous studies. First, Amrhein et al. (2003) found that strength of commitment in later deciles predicted drug use at 1-year follow-up and that reason, ability, desire, and need statements were associated with client commitment. Two additional studies, however, highlight that analyses of specific dimensions of client change language may reveal a variable role across time, population, or outcome (Baer et al., 2008; Gaume, Gmel, & Daeppen, 2007).

In this study, positive ability, positive desire, and negative desire statements showed greater coefficient magnitudes than positive statements of commitment. This pattern of findings is somewhat consistent with two prior studies using similar methodology (especially the use of the MISC coding instrument). First, in a sample of non-treatment-seeking adolescents, negative desire and ability were associated with substance use at 1- and 3-month follow-up (Baer et al., 2008). Second, among drinkers recruited in a hospital setting, ability statements predicted alcohol use 1 year later, whereas other change talk dimensions did not (Gaume et al., 2007). It may be that language preceding the Change Plan will function differently than language occurring within the Change Plan in relation to follow-up alcohol use. Perhaps, the best framework for understanding these results is Rollnick's (1998) discussion of a client becoming "ready, willing, and able" to commit to change. Through statements indicating that they want, desire, or value making a change, a client expresses a willingness to engage in the change process. In addition to desire for change, a client must believe he or she is capable of change (Rollnick, 1998). These categories of client change talk may precede and predict a commitment to change as operationalized in the decision to complete a Change Plan.

Our findings on the predictive role of therapist behaviors were unexpected. Specifically, in the final model, only therapist use of open questions was significant, and neither simple nor complex reflections were associated with a client's decision to complete a Change Plan. Miller and Rollnick (2002) emphasize the combination of questions and reflections as a foundation of MI's client-centered and directive approach. Tollison et al. (2008) found that open

questions were associated with student contemplation of change in a peer-delivered MI-informed intervention, that simple reflections predicted *increased* alcohol use at short-term follow-up, but the combined use of complex reflections lessoned this effect (Tollison et al., 2008). The present work supports the value of open questions in predicting Change Plan completion, but research should further examine the interaction of MI behaviors in relation to client change.

4.2. Study limitations and future directions

There are some limitations to consider when interpreting the results of this study. First, the study was conducted with adult emergency and trauma department patients, and a portion (52%) of the sample experienced an injury; it is unknown how results will generalize to other client populations. Second, some variables were excluded from analyses. Future analyses should consider completion of the Change Plan in relation to other proximal behavior changes (e.g., specific strategies to limit drinking or enlistment of network supports) as well as main effect drinking outcomes. Such directions can help to identify the effective elements of MI and thus inform necessary treatment ingredients. With empirical linkage of Change Plan completion to client postsession cognitive and behavioral changes, the Change Plan can be validated as a within-session marker of a motivational shift from exploration to intent. Finally, we need to consider how MI should be conducted differently with clients whose change language does not show increasing motivation (see Change Plan noncompleters in Fig. 1). Are these clients for whom MI is not appropriate or can MI therapists be trained to respond differently to these clients? Similarly, should MI, or at least one- or two-session MI, be conducted with clients at a certain motivational stage? The noted directions may bring us closer to understanding the processes of MI and further inform therapists of ways to maximize its therapeutic benefit.

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